Visualization in Motion

Details

Advisor

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Internship Location

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Topic

Visualizations are often useful in contexts in which the display or observer does not remain static but is moving at various speeds. Imagine, for example, displays attached to an athlete or animal that show data about the wearer – for example, captured from a fitness tracking band; or a visualization attached to a moving object such as a vehicle or a soccer ball. In these mobile and dynamic use cases, visualizations have to overcome new challenges if we want the data to be readable by the human observer.

The goal of the internship is to either:
- develop a prototype visualization that is moving, or
- develop a static visualization that is meant to be read while the observer is moving.

Part of the internship project is to brainstorm possible scenarios and pick one promising and realizable example to implement. We have several resources in the lab to implement solutions including VR headsets, a fablab for working with electronics or 3D printing, and other material can be purchased as well.

(smart soccer ball - source)
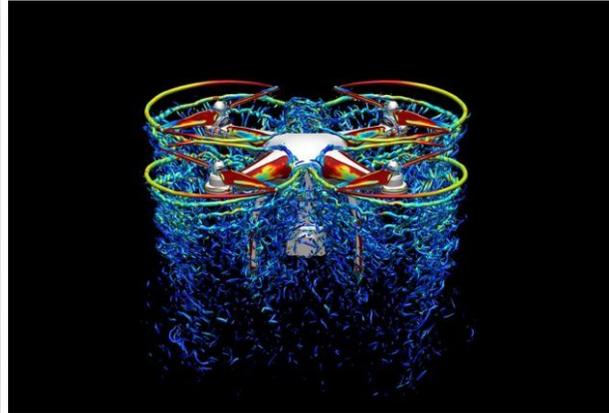
(visualization around a drone - source)

(live sports tracking - source)

(moving data display mockup)

Background

The main research area of this internship is personal visual analytics. Personal analytics, in contrast to expert-led analytics, focuses on giving the general public effective and accessible tools to make sense of and use their own data. This project is connected to a larger research grant in which we focus on situated data visualizations of personal data in a variety of application contexts. In a situated data visualization, the data is directly visualized near the physical space, object, or person it originates from

[Willett et al., 2017]. For example, a person may attach small e-ink displays embedded with sensors at various locations of their house, in order to better understand their use of space, of equipment, or of energy resources. Alternatively, a person who wishes to exercise more may use an augmented reality device to visualize their past running performance in-place; or project data into the physical world by using Spatial Augmented Reality setups. Tiny data displays may also take the form of "data jewellery" to help people share personal information in social settings [Jansen et al., 2015]. New situated data visualizations like these can surface information in the physical environment – allowing viewers to interpret data in-context and take action in response. Because they make it possible to explore and act on data in relevant physical locations, they have the potential to radically transform how we relate to data. They can help people leverage information about their own activities in order to adapt and tailor their personal spaces, make more informed decisions, or improve their well-being.

W. Willett, Y. Jansen, and P. Dragicevic. Embedded data representations. IEEE TVCG , 23(1):461–470, Jan. 2017 https://hal.inria.fr/hal-01377901